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## A review of the antiparasitic medicinal plants used in ethnobotany of different regions of Iran

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### ABSTRACT

*Parasitic diseases are considered the most prevalent infectious diseases worldwide, involving half of global population particularly in developing countries. Given the necessity of producing nature- and plant-based drugs for parasitic diseases, this study is to report the medicinal plants used in different regions of Iran. In this review article, the terms parasite, ethnobotany, and medicinal plants were used to search for the articles, the books, and the documents about Iran traditional medicine in domestic and international databases including Information, SID Web of Science, PubMed, Scopus, Islamic World Science Citation Center, Magiran. Satureja, wormwood, Artemisia Zagros, tobacco, Sisymbrium irio, walnuts, nettle, garlic, zucchini and chamomile are the most important antiparasitic medicinal plants of Iran.*

**Keywords:** Parasitic diseases, Medicinal plants, Iran

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### INTRODUCTION

Worldwide, parasitic diseases are considered the most prevalent infectious diseases [1], involving half of the global population particularly in developing countries. Children are more affected by these diseases than other age populations. Mortality, growth failure, declined academic performance, and some other physical and psychological problems are some of the outcomes of parasitic diseases [2]. In addition, some studies have suggested an association between chronic parasitic diseases and the spread and severity of other infectious diseases such as HIV/AIDS and leprosy [3]. The most common parasitic diseases are intestinal infections including ascariasis, amebiasis, trichuriasis, and hookworm infection. These are among the ten leading infections worldwide, involve over two billion people [4], and are more prevalent in poor people and densely populated areas [4]. Many antiparasitic drugs may cause side effects [5-10]. Given increasing tendency of physicians towards use of plants for treating diseases [11-21], identification of medicinal plants in traditional medicine references and ethnobotany could assist in doing more comprehensive studies [22-29]. Furthermore, it is necessary for plant-based products to become publicly available in acceptable and safe rather than traditional packages [30-34]. Obviously, plants can be suitable alternatives to chemical drugs for many cases [35-40].

Regarding the necessity of producing nature- and plant-based drugs for parasitic diseases, we sought to report the medicinal plants used in different regions of Iran.

Relevant articles, books, and documents about Iranian traditional medicine were searched using the terms parasite, ethnobotany, and medicinal plants in international and domestic databases including International Sciences Institute (Web of Science), PubMed, Scopus, Islamic World Science Citation Center, and Magiran.

Traditionally, 56 plants are used to treat parasitic diseases in east, west, north, south, and central Iran. Satureja, wormwood, Artemisia Zagros, tobacco, Sisymbrium irio, walnuts, nettle, garlic, zucchini and chamomile are the most important antiparasitic medicinal plants of Iran.

Other antiparasitic medicinal plants occurring in different regions of Iran are listed in detail in Table 1.

**Table 1. Antiparasitic medicinal plants native to different regions of Iran (Persian name, scientific name, and used parts) Province**

Row	Scientific name	Family	Persian name	Used part(s)	Therapeutic effect	
1	<i>Fumariaofficinalis</i> L.	Fumariaceae	Shahtareh	Root	Antiparasitic	West Azarbaijan [41]
2	<i>Prangoserulacea</i>	Apiaceae	Marzeh	Root	Antiparasitic	West Azarbaijan [41]
3	<i>Artemisiaabsinthium</i> L.	Compositae	Afsantin	Flowering shoot	Anti worm and antiparasitic	Arasbaran [42]
4	<i>Alliariapietolata</i>	Cruciferae	Alafe sir	Plant syrup	Anti worm	Arasbaran [42]
5	<i>Allium akaka</i> Gmelin.	Aliaceae	Valak	Leaf and bulb	Antiparasitic	Ilam [43]
6	<i>Artemisia sieberi</i> Besser.	Asteraceae	Dermaneyezagrosi	Stem and leaf	Antiparasitic	Ilam [43]
7	<i>Nasturtium officinale</i> (L.) R. Br.	Brassicaceae	Alafeshor	Leaf, root, and stem	Antiparasitic	Ilam [43]
8	<i>Narcissus tazetta</i> L.	Amaryllidaceae	Narges	Flower and bulb	Antiparasitic	Ilam [43]
9	<i>Nicotianatabacum</i> L.	Solanaceae	Tanbakou	Leaf	Antiparasitic	Ilam [43]
10	<i>Portulacaoleracea</i> L.	Portulacaceae	Khorfeh	Leaf, stem, and root	Antiparasitic	Ilam [43]
11	<i>Rubusanatolicus</i> (Focke.) Focke ex Hausskn.	Rosaceae	Tameshk barge-narvani	Fruit	Antiparasitic	Ilam [43]
12	<i>Descurainiasophia</i>	Brassicaceae	Khakeshir	Seed	Antiparasitic	Kerman [44]
13	<i>Ferula assa-foetida</i>	Apiaceae	Anghouzeh	Gum	Antiparasitic	Kerman [44]
14	<i>Juglansregia</i>	Juglandaceae	Kerdou	Leaf, fruit, and Peel	Antiparasitic	Kerman [44]
15	<i>Artemisia Sieberi</i> Besser	Asteraceae	Dermaneh	Leaf	Antiparasitic	Jandagh [45]
16	<i>Halothammusauriculatus</i> (Moq.) Botsch	Chenopodiaceae	Marchoubeh	Leaf	Antiparasitic	Jandagh [45]
17	<i>Calotropisprocerat</i> (Aiton) W.T.Aiton	Asclepiadaceae	Estarbagh	Leaf	Antiparasitic	Southeast Persian Gulf [46]
18	<i>Morus alba</i> L.	Moraceae	Toutesephid	Leaf and stem	Antiparasitic	Southeast Persian Gulf [46]
19	<i>Plantagocoronopus</i> subspcommutataL.	Plantaginaceae	Barhangshakh-gavazni	Inflorescence	Antiparasitic	Southeast Persian Gulf [46]
20	<i>Phragmitesaustralis</i> (Cav.) Steud.	Poaceae	Ney	Root	Antiparasitic	Southeast Persian Gulf [46]
21	<i>Daucuscarota</i> L.	Apiaceae	havich	Fruit	Anti worm	Khouzestan [47]
2	<i>Doremaammoniacum</i>	Apiaceae	Vosha	Resin	Antiparasitic	Khouzestan [47]
23	<i>Ferula assa-foetida</i> L.	Apiaceae	Anghouzeh	Root and resin	Antiparasitic	Khouzestan [47]
24	<i>Pimpinellaanisum</i>	Apiaceae	Anison	Root	Antiparasitic	Khouzestan [47]
25	<i>Smyrniuncordifolium</i> Boiss.	Apiaceae	Avandol	Stem	Antiparasitic	Khouzestan [47]
26	<i>Trachyspermumcopticum</i> L.	Apiaceae	Zenian	Fruit and seed	Antiparasitic	Khouzestan [47]
27	<i>Artemisia maritime</i> L.	Asteraceae	Dermaneh	Flowering shoot	Anti worm	Khouzestan [47]
28	<i>Artemisia sieberi</i> Besser.	Asteraceae	Dernaneyedashti	Leaf and seed	Anti worm	Khouzestan [47]
29	<i>Bellisammul</i> L.	Asteraceae	Minayechamani	Flower	Anti worm	Khouzestan [47]
30	<i>Calendula officinalis</i> L.	Asteraceae	Hamishebahar	Flower	Antiparasitic	Khouzestan [47]
31	<i>Gundeliatournefortii</i> L.	Asteraceae	Kangar	Stem	Antiparasitic	Khouzestan [47]
32	<i>Descurainiasophia</i>	Brassicaceae	Khaheshir	Seed	Antiparasitic	Khouzestan [47]
33	<i>Eruca sativa</i> Mill.	Brassicaceae	Mandab	Seed	Anti worm	Khouzestan [47]
34	<i>Nasturtium officinale</i> L. R.Br.	Brassicaceae	Alafesheshmeh	Stem	Anti worm	Khouzestan [47]
35	<i>Lavandulaangustifolia</i> Mill.	Lamiaceae	Ostokhodous	Flower, seed, and stem	Antiparasitic	Khouzestan [47]
36	<i>Peganumharmala</i> L.	Nitriaceae	Esfand	Seed and fruit	Antiparasitic	Khouzestan [47]
37	<i>Reseda lutea</i> L.	Resedaceae	Vers	Flower	Antiparasitic	Khouzestan [47]
38	<i>Ziziphnummularia</i> Burn.f.Wight&Arn.	Rhamaceae	Ramlik	Fruit	Antiparasitic	Khouzestan [47]
39	<i>Amygdalusscoparia</i> Spach.	Rosaceae	Badam	Fruit	Anti worm	Khouzestan [47]
40	<i>Urtiandrundoical</i> L.	Urticaceae	Gazaneh	Leaf	Anti worm	Khouzestan [47]
41	<i>Descurainiasophia</i>	Brassicaceae	Khaheshir	Seed	Antiparasitic	\Sirjan, Kerman [48]
42	<i>Juglansregia</i>	Juglandaceae	Gerdou	Leaf, fruit, and peel	Antiparasitic	Sirjan, Kerman [48]
43	<i>Morusnigra</i>	Moraceae	Shah tout	Leaf, fruit, and peel	Antiparasitic	Sirjan, Kerman [48]
44	<i>Conyzacanadensis</i> (L.) Cronq.	Asteraceae	Pirgiah	-	Antiparasitic	Kazeroun [49]
45	<i>Fraxinusangustifolia</i> Vahl.	Oleaceae	Zabangonjeshk	-	Antiparasitic	Kazeroun [49]
46	<i>Thymus daenensis</i> celak.	Lamiaceae	Avishan	Leaf and branch	Antiparasitic	Mobarakeh, Isfahan [50]
47	<i>Allium sativum</i> L.	Alliaceae	Sir	-	Antiparasitic	Mobarakeh, Isfahan [50]
48	<i>Punicagranatum</i> L.	Punicaceae	Anar	-	Antiparasitic	Mobarakeh, Isfahan [50]
49	<i>Tragopogongraminifolius</i> DC.	Asteraceae	Sheng	Leave and stem	Antiparasitic	Mobarakeh, Isfahan [50]
50	<i>Cucurbitapepo</i>	Cucurbitaceae	Kadou	Fruit	Antiparasitic	Mobarakeh, Isfahan [50]
51	<i>Foeniculumvulgare</i> Mill	Apiaceae	Razianeh	Fruit	Antiparasitic	Mobarakeh, Isfahan [50]
52	<i>Falcaria vulgaris</i> Bernh.	Apiaceae	Ghazyaghi	Leaf and seed	Anti worm	Marivan [51]
53	<i>Anthemisaltissima</i> L. var.	Asteraceae	Babaouneyerafie	Flowering shoot	Anti worm	Marivan [51]
54	<i>Anthemistinctioria</i> L.	Asteraceae	Babouneyezard	Flowering shoot	Anti worm	Marivan [51]
55	<i>Helichrysomoligocephalum</i> DC.		Golebibarge-kamkapeh	Flowering shoot	Antiparasitic	Marivan [51]
56	<i>Euphorbia macrocarpa</i> Boiss. & Buhse.	Euphorbiaceae	Ferifonramsari	Leaf and stem	Antiparasitic	Marivan [51]

## DISCUSSION

Overall, this study indicated that Iranian people from different cultures and in different regions of this country use 56 medicinal plants traditionally to treat parasitic diseases specifically.

Infectious and non-infectious diseases are constantly spreading and therefore diagnosing, preventing, and treating these diseases is particularly important [52-79]. The medicinal plants reported in this study could help to conduct investigations about parasitic diseases so that nature-based, effective drugs that cause fewer side effects than chemical drugs may be produced for this common problem. The medicinal plants of this study have antiparasitic

effects because of containing certain effective components such as phenolic compounds including flavonoids, tannins, and anthocyanins, and therefore can treat parasitic diseases. Phenolic compounds have been shown to have anti-bacterial and anti-parasite activities [79-81]. There are a lot of other plants which have high levels of phenolic compounds [82-95]. These plants may also have anti-parasite activities which worth examining. Phenolic compounds also have antioxidant activities which may be beneficial in other diseases [96,97]. In addition, these plants have pharmacologic effects because of containing effective substances and may be used instead of antiparasitic chemical drugs if their efficacy is confirmed in scientific investigations.

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